# PERCEPTIONS OF ICT USE IN GUARDA'S PRIMARY SCHOOLS

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## Abstract

We have been witnessing the rise of a different model in education, starting in primary school. On one hand, teaching is very student-centered, on the other, technology is spreading and taking room in school environment. Consequently the roles of the teacher/pupil/parents and the interaction itself have changed. In Portugal, there have been some programs sponsored by the Ministry of Education, since the eighties. We highlight three major programs: Minerva, Programa Internet na Escola (Program Internet at school) and Plano Tecnológico na Educação (Technological Plan in Education). One of the goals of this last program aimed the increase of the use of ICT in at least 25% of the classes. Another goal was to achieve the ratio of 2 pupils for a computer provided with internet access. In order to achieve the goals, a new computer was created, specially designed for children: the Magalhães which was supplied by the Ministry at a very reasonable according to the families' income all over the country.

The project Interactive Approaches in Education was carried out by researchers from the Research Unit for Inland Development (UDI), from the Polytechnic Institute of Guarda. The main objective is to assess the influence of the use of these programs in elementary schools, in Guarda's county. This project tried to assess the use of ICT in all primary schools by teachers, pupils and parents. Issues such as the integration and use of ICT in the overall context of elementary schools, the perception of the digital literacy of the students, teachers and parents and ICT's influence in the construction of knowledge from a multidisciplinary point of view.

The study was carried out from April 2012 to June 2012. In a first phase, the study implied the development of the questionnaire and its validation. The methodology used is empirical and descriptive. This methodology allows to describe the characteristics of population. The questionnaire was the tool used to collect data for our study. Thus, the target market of our research has involved all the students, teachers and parents from the public primary schools in Guarda's county. We are presenting the final results of the study, currently crossing data from the perceptions of parents, students and teachers from primary schools in Guarda's county, their habits in using computers and their sensitivity towards Magalhães computer.

From the results obtained, we can conclude that almost all students/teachers have a permanent contact with technologies, that parents value this sort of practice. It can also be observed that the practice is held in different contexts and for different finality.

Keywords: Primary school, ICT programs.

## 1 ICT INTEGRATION IN PRIMARY EDUCATION IN PORTUGAL

In Portugal, since the eighties, there have been some programs sponsored by the Ministry of Education. Within a worldwide growing conscience of the importance of the computer and its capacities, several European countries have started a steady investment in ICT in educational curricula. In Portugal, this period of investment corresponds to the period prior to the Portuguese entry into the European Community. Consequently, that represented a motivation in the investment in the area of education and ICT. According to many scholars, Portugal has indeed succeeded in this first technological updating [1].

In the eighties, the project Minerva (Meios Informáticos no Ensino – Racionalização, Valorização, Atualização) came to light, lasting from 1985 to 1994. Its main concern was the diffusion of the use of computers among the population which represented the basis of the restructuring of an educational reform felt as needed in order to improve the quality of the educational system and also a tool for the international cooperation.

In the primary school there were, however, some obstacles to be surpassed, such as the instability of the teaching staff and the disinvestment suffered in these particular schooling years, exposed namely

in the out-of-date hardware and software of the schools. Nonetheless, the legal system states the existence of one single teacher responsible for the teaching of all the curricula in one class and this situation enabled the use of one single computer in a single classroom. The same computer was fully used as an educational resource extended to all the areas taught in primary school context. Minerva project did not solve all the problems concerning ICT. However, primary teachers became more confident and appreciated regarding other school levels' peers. For all these reasons, Minerva program can be considered the foundation of the ICT programmes to be. Later, in October 1996, the Ministry of Education launched the Nónio-Século XXI, which was active up to the end of 2002. Simultaneously, from 1997 to 2003, the Ministry of Science and Technology, created the Program Internet in Schools, whose main objective was to install at least one multimedia computer in the library or in the media library in all the schools from primary to high school, guaranteeing the Internet access through the net of the Ministry (Rede Ciência, Tecnologia e Sociedade (RCTS)). To support this last program, a unit of support - the Unidade de Apoio à Rede Telemática Educativa –uARTE - was then produced aiming the promotion and cooperation between the different educational agents and the production of scientific and technological content available to all online. Some other programs were launched in the following years; it can be said that one program was replaced by another one, basically with very similar aims. Thus in 2002 there was Programa Internet@EB1 that was restored in 2005/2006 by the program Competências Básicas em TIC nas EB - CBTIC@EB1. The former sought after the use of computers and the Internet in primary schools for pedagogical purposes. The Ministry of Education and University and Polytechnic Institutes were involved in the partnership.

The document printed by the Ministry Council number 137/2007 still acknowledged several problems, specifically in the area of Technology, Contents and Teacher Formation. This is the reason why the Technological Plan of Education (Plano Tecnológico da Educação (PTE) from 2007 to 2010) was created. The goals were quite ambitious: a ratio of two pupils per computer, the full connection to the Internet in high speed of 48Mbps up to 2010 and the use of ICT in, at least, 25% of the classes. In 2008, the Government initiated the program e. escolinha, intending the acquisition of a low cost computer for children - Magalhães – with Internet access. This program aimed to increase the access to the Internet and the use of computers in order to abridge the access to the society of information and to endorse info inclusion and the equality of opportunities. Children from primary schools had the right to purchase a computer costing up to 50 Euros, according to their parents' income, including free access to the Internet by using Portuguese operators. A year after the beginning of the program, 412700 computers had already been sold and distributed.

## 2 THE PROJECT INTERACTIVE APPROACHES IN EDUCATION

Information and Communication Technology (ICT) is definitely altering our society. ICT is "everywhere, at all times, in all places" (original *"tecnologia está em tudo,a toda a hora, em qualquer lugar"*) [2]. In the last decades, ICT has changed the places where we live in, the way we connect with other, the relations in a society, the way we work and how we access information. [3] [4] [5].

ICT are educational tools with a huge potential. It is undeniable its use in daily school life, no matter the age or the school level of the students [6]. It can be used in the improvement of learning and the teaching process and it can also facilitate the introduction of some innovative approaches. Besides, its use in school context should be promoted for social reasons, once students must be prepared to face a technological society.

We have been witnessing the rise of a distinctive model in education, starting in primary school. On one hand, teaching is very student-centered, on the other; technology is spreading and taking room in school environment. Consequently the roles of the teacher/pupil/parents and the interaction itself have changed.

The project Interactive Approaches in Education is being carried out by a team of researchers from the Research Unit for the Inland Development from the Polytechnic Institute of Guarda. The purpose of the project is to assess the use of ICT in education, especially as far as the computer is concerned and more particularly as far as the Magalhães is concerned, in the case of the primary schools from Guarda's county. Besides the analysis of the integration and use of ICT in primary schools in its total dimension, it is also our intention to study the development of ICT competences and the digital literacy of the students, parents and teachers connected to Guarda's primary schools.

Furthermore, we aimed to consider ICT's inclusion in knowledge construction from a multidisciplinary point of view. A critical reflexion on the outlook of the integration of ICT has become relevant as the

technological development and the general access to the Internet have changed social behaviour and might have changed educational practices in school context. The access to information is permanent by now and that is why the integration of technology in schools should answer to the expectations of a demanding society, related to the competences students must have. According to the effort undertaken in the scope of the Technological Plan of Education (PTE), the existence of technology in school environment can be considered real. A priori schools are well equipped however this may not correspond to the use of technology in learning and teaching context [6].

## 2.1 Methodology

The methodology adopted for this study was empirical and descriptive, this methodology allows us to describe the characteristics of a population [8]. Our universe was made of all the students, teachers and parents or carers of the public primary schools in Guarda.

Our study took place from April 2012 to June 2012. To begin with, the researcher had to develop and legalize the questionnaires. Then, their contents were validated.

The process of data collection was structured in different phases. To begin with, we had to ask for a special authorization to a particular office from the Ministry of Education (Direcção-Geral de Inovação e de Desenvolvimento Curricular and Gabinete de Estatística e Planeamento da Educação). Afterwards, we communicated that authorization to the school clusters' directors and arranged with them the visits' schedules to the schools. These visits included the physical presence of some of the researchers involved.

Data collection was done with three different surveys by questionnaire, aiming children, teachers and parents from public primary schools of public in Guarda's council. This paper is about the parents' survey.

As a way to reach the goals we proposed in a systematic way, we used surveys by questionnaire to the students, parents and teachers. It is generally consensual [8] that objective questions are more easily answered when comparing them to subjective questions. Objective questions tend to minimize ambiguity and therefore demand less effort in comprehending them. This sort of tool also makes the analysis of information easier and less time consuming.

When we made our questionnaire, we tried to maximize the number of valid answers by using a simple survey, whether in clarity and objectivity. We attempted to avoid dissuasive approaches in order to obtain the maximum answers.

We have used three different questionnaires with the following goals:

I. Questionnaires directed to the pupils, aiming to assess the way they use ICT, the tools they are able to operate, in what context and if they require any support for that;

II. Questionnaires directed to the teachers, with the objective of finding out they perspectives towards the integration of ICT in classes;

III. Questionnaires directed to parents or carers to check their own ICT competences, if they promote the use of ICT to schoolwork and if they supervise their children's activities.

The process of data collection took two months to be carried on and had the active participation of parents, researchers, educators and pupils. The questionnaires of the students were answered in class, in the presence of the primary teacher and a researcher. The questionnaires for the teachers were left at the school for a week, as well as the parents' questionnaires. Subsequently, the researchers went back to the schools to collect these two questionnaires. For data analysis, we used SPSS (Statistical Package for the Social Sciences).

# 3 RESULTS

In the results of the study we are going to present the results obtained from the questionnaires to parents/carers, teachers and students from the 24 public schools in Guarda's county. The analysis is based on 1064 and 1080 survey questionnaires answered by, respectively, parents/carers and students.

## 3.1 General characterization of the interviewed

As far as age is concerned, regular pupils attending primary schools in Portugal are mainly between six and ten years old. More specifically, in the 24 schools studied, there are 14,7% of the children with six years old, 24,4% with seven; 2,2 % with eight years old and 22,4% with nine years and finally 9,6 with ten and 1,8 with more than ten years. Although it was meant to have a hundred percent coverage of the parents, the fact is that not all of them accepted to answer the questionnaires. According to the results, most of the parents/carers are from thirty to thirty-nine years old (48%). 39% of them are aged between forty and forty-nine, whereas 11% are less than thirty years old. A minority of 2% are more than fifty.

We have received 80 surveys from the primary teachers working in public schools in Guarda's council. As far as characterization of teachers is concerned, we notice that they are mostly women (91%) and aged 50 or more.

## 3.2 Crossing data from the perceptions of parents, students and teachers

Based on the three different surveys and in the collected data we analyse the three perceptions of informatics tools use in different ways. However, our goal is crossing information from parents, students and teachers as far as we can.

From students' answers, we get to know 994 (92%, n=1080) have a computer and 1018 (94,3%) say that they can use it (fig. 1). This shows that there are students who do not have a computer but have or had contact with such equipment. This may be related with high computer use in Free Time Activities Centres, as mentioned by 995 (46,9%) students. The school is the place where 452 (21,3%) students say they use the computer (fig. 1).

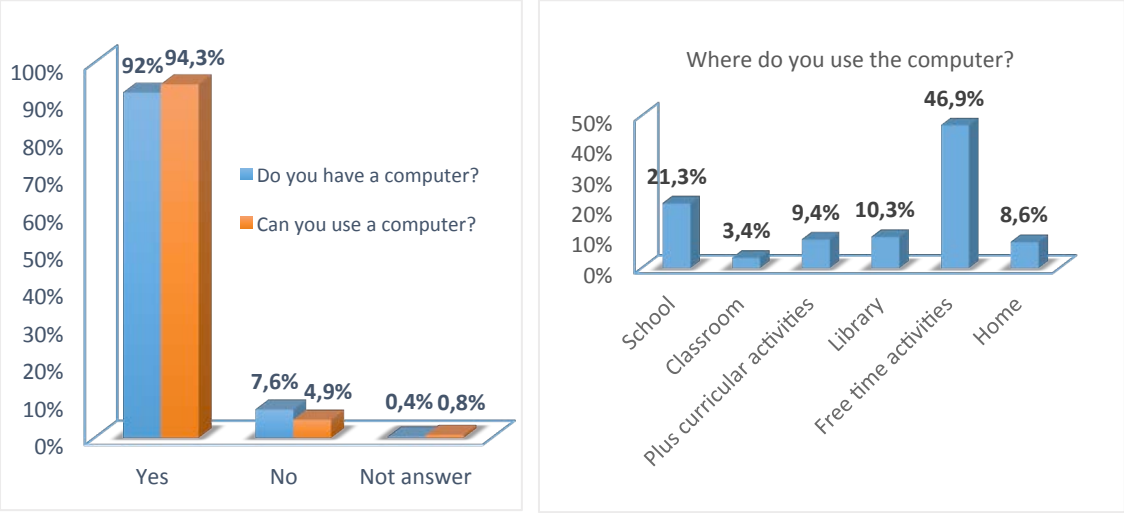


Fig. 1 – Distribution of students answers about having and using the computer.

The teachers' opinion about students' competence (fig. 2), allows us to conclude that the majority (59%, n=80) of the teachers classify the performance of their students as satisfying. This result can be considered in accordance with the self-assessment of the students (fig. 1).

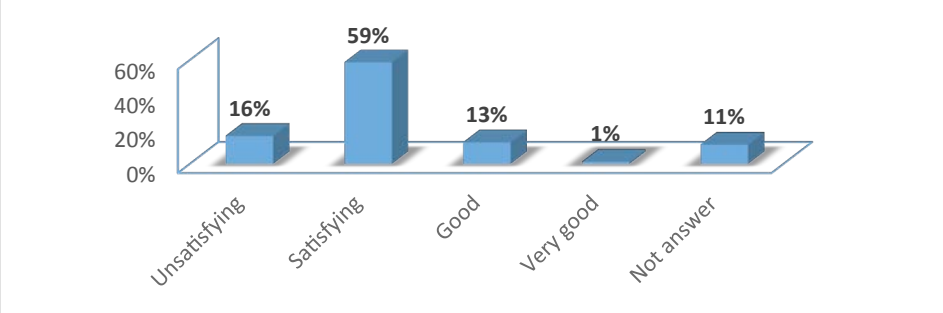


Fig. 2 – Students competence to use a computer, according to teachers' opinion.

It is important that each person, in particular a teacher or a parent/carer, is able to identify his/her weakness and strengths. In their role of teachers and educators, they must evaluate their performance and, when necessary, search strategies to improve their practices, and sometimes this involves attending specific courses. So, with regard to competence in using informatics tools, we have asked teachers and parents/carers to classify their competence (fig. 3). There a higher percentage of parents/carers than teachers that qualifies their competence with good or very good. On the other hand, the majority of teachers (62,5%, n=80) consider that their competence is satisfying. The classification of unsatisfying was selected by 97 parents/carers (9%, n=1064) and by 5 teachers (6,3%, n=80).

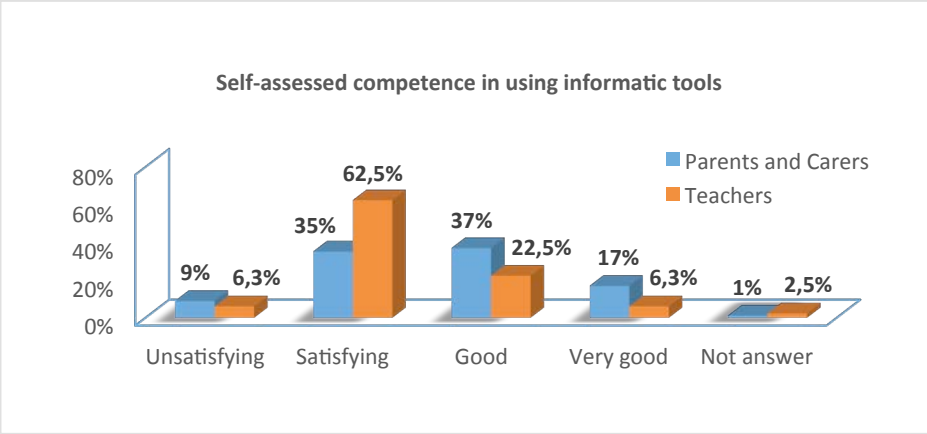


Fig. 3 – Distribution from Teachers', Parents'/Carers' competence to use computers.

The family support, in the different situations, is an important dimension of children's lives and is fundamental in their physical and intellectual growth process. In this context, teachers expressed their perception of family support given to students (fig. 4). The majority of their answers are divided between almost all students (40%, n=80) and few students (46%, n=80) have family support with informatics tools. Since the highest percentage of teachers says that few students have family support and only 3% (n=80) say that all students have family support, doubts could be raised in the answers given by parents/carers about their ability to work with informatics tools (fig.3). Furthermore, we observed that 40% (n=1080, fig.4) of the students learn to use computer with their parents and 15% with brothers. However, 24% of the students say that they have learned alone. This could be possible, because children have a great capacity for learning and can learn by simply watching older people.

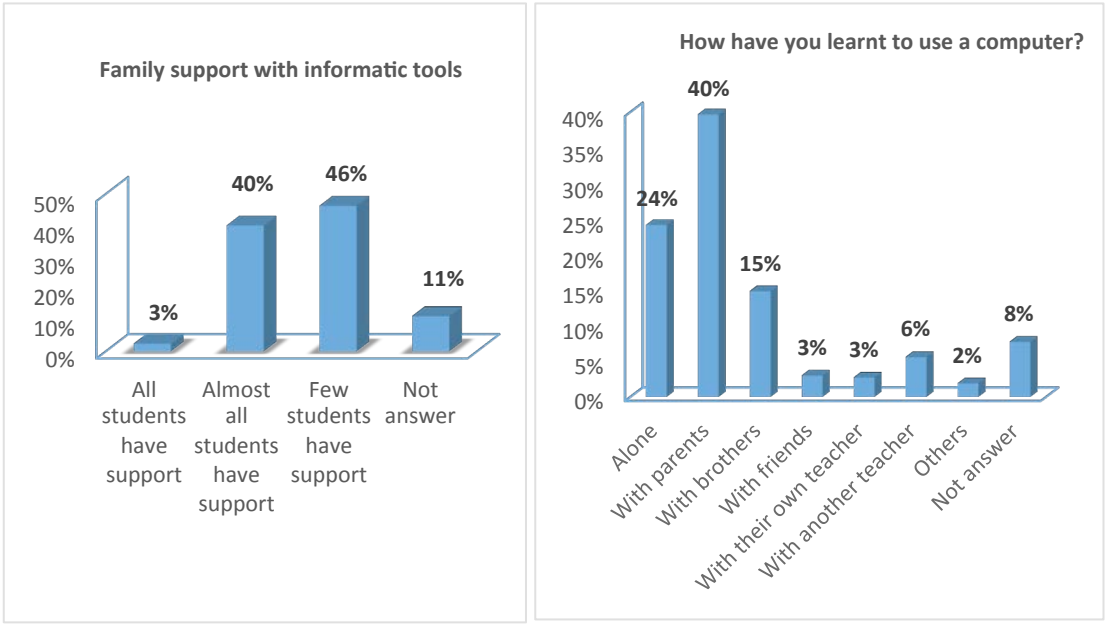


Fig. 4 – Distribution of the family support and how students have learnt to use computer.

In current technological context, the compute is a crucial tool, as is present in the everyday of the general population and, as such, students. Hence, because school is an important part of society, the computer is present in the school life, even when it isn't used in the teaching/learning process. Furthermore, it is intended to increase digital competence of the population, which necessarily involves school. Note that despite its widespread use, particularly by children and young people, this does not mean that their level of digital literacy, in this item, is high. Thus, it seems essential that the teacher integrate his/her use in teaching / learning process, whenever it is an appropriate strategy, well-planned to promote meaningful learning. Thus, we inquired parents/carers and teachers about the importance they confer to computer use for schoolwork (fig. 5). The majority of the parents/carers (60,8%, n=1064) and teachers (70%, n=80) consider that using computer in schoolwork is important and none of the teachers classifies as not important at all and this was the choice of 2,1% of the parents/carers. So, in this point there is agreement between both sides.

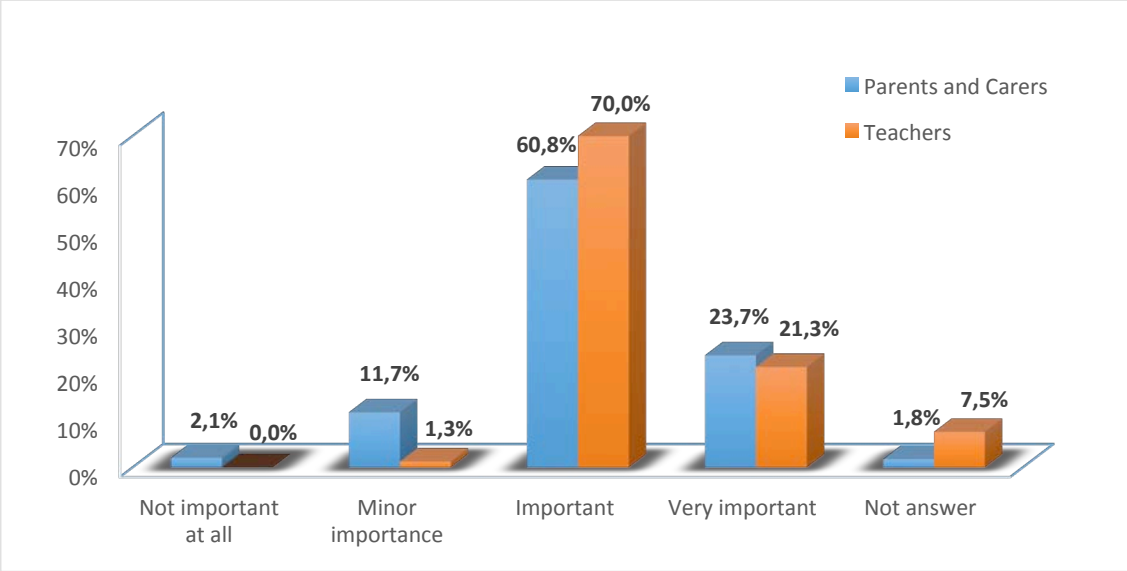


Fig. 5 – Distribution of parents'/carers' and teachers' opinion about computer use for schoolwork.

Thereby, students were inquired about the use they gave to the computer at school and at home. From the results (fig. 6) we can see that students use computer in the school as support in the study of different subjects and to develop other knowledge/skills, but these are not mentioned by the majority of the students. We highlighted that, at home, students says their main use is to play (86,3%, n=1080).

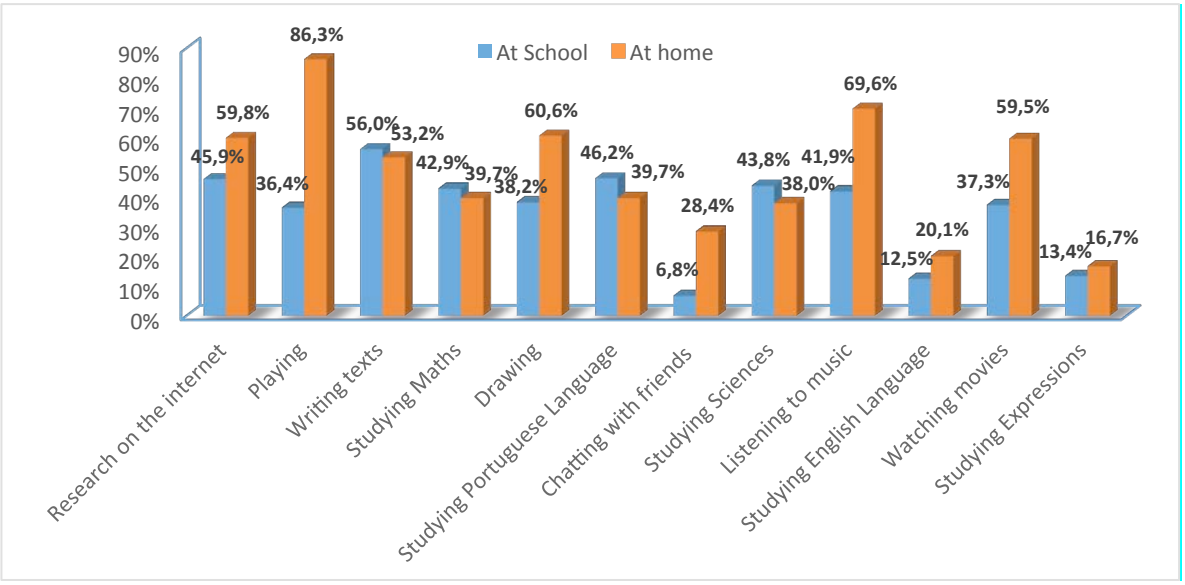


Fig. 6 – What use students give to the computer at school and at home.

In this context, teachers also presented their choices for computer in schoolwork (fig. 7) and the majority (74%, n=80) use computer for research followed by the project work (54%, n=80). By the student's answers, presented in fig.6, we could say that, at school, the research in the internet (45,9%, n=1080), writing texts (56%, n=1080) and studying Portuguese language (46,2%) are the activities that stand out and meet the teachers' results.

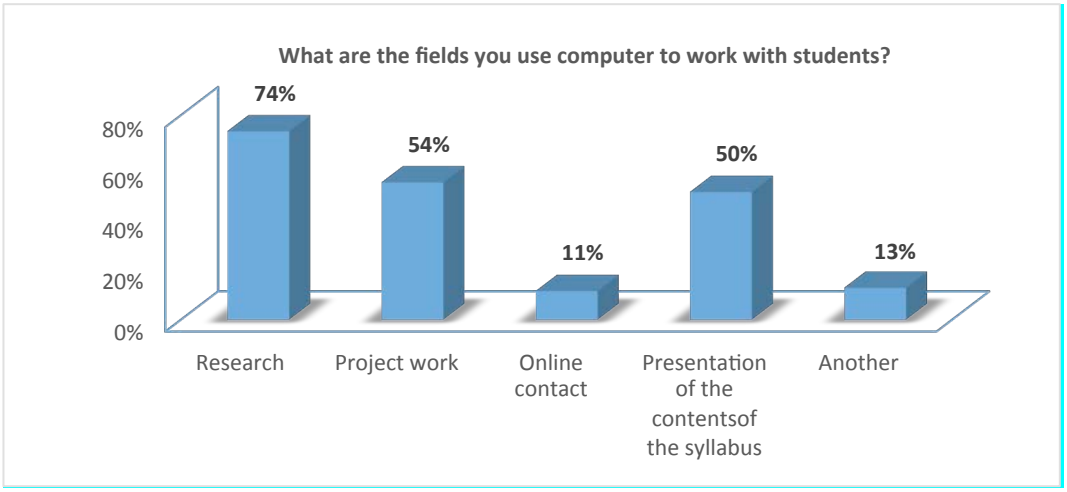


Fig. 7 – The fields chosen by teachers to work with students.

The community of people whose professional area involves working with children or young people of school age, has been warning about the time that children and young people spend on the computer. We intend to analyse the weekly distribution of computer usage time and questioned the students in this sense (fig. 8). Results show that the highest use of computer is at the weekend, Saturday with 81% and Sunday with 72%. In addition, parents/carers and teachers were asked to the number of days that their children were using the computer or using it in the classroom context, respectively (fig. 8). We could conclude that the percentage of teachers not answered (24%, n=80) is high, but the majority use more than once a week. The answers given by parents/carers go in the direction of the answers given by the students, the highest percentage is 41% for 2 or 3 times a week.

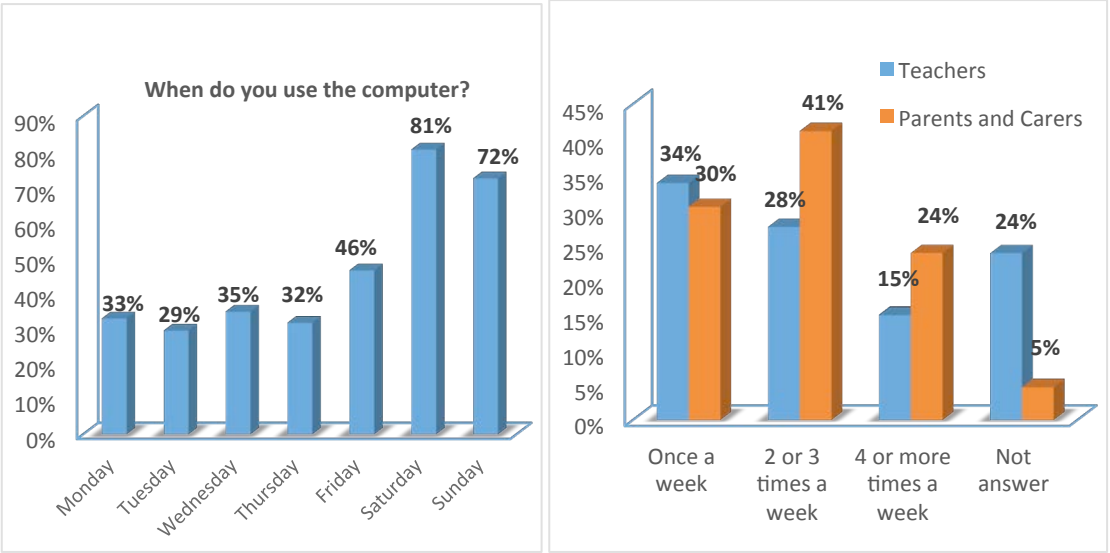


Fig. 8 – Distribution the time utilization of computer by students.

The Technological Plan of Education, mentioned before, has had a central part in the educational policies in Portugal, especially with the appearance of the *Magalhães*. We wanted to know the level joining to *Magalhães* and asked teachers to tell us how it was in their classroom what was joining the program. By the results presented in fig. 9 we could say there was a high access, because 61% (n=80) of the teachers mentioned that more than 76% of their students acquired a computer

*Magalhães*. The next step was to ask students if they had a *Magalhães* and if they used it to work/study or to play. From the 825 (76,4%, n=1080) students who acquired it, 557 said they used it in both activites, 127 just for school work and 133 just to play. The majority of the students use it at home (73%,n=1080).

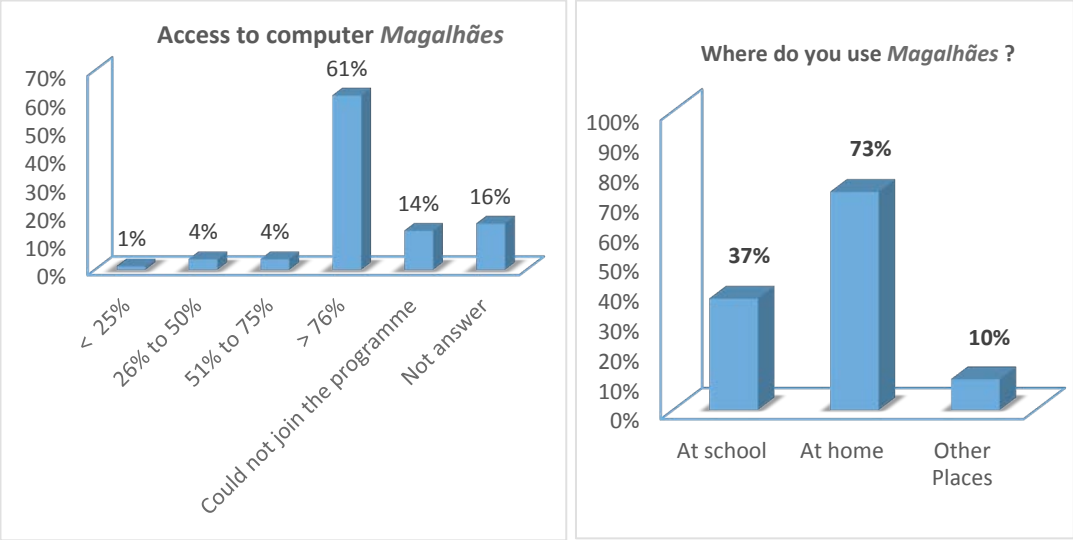


Fig. 9 – Distribution of the access to computer *Magalhães*, in teachers' opinion, and students answers for the place of use.

The *Magalhães* was contentious in the educational community, namely its operability. For this reason we inquired parents/carers, teachers and students about that. By the results (fig. 10) we conclude that the majority of the parents' / carers' (58%, n=1064) and teachers' (55%, n=80) opinion is that it works well. Further, the high percentage of the students said it works very well (36%, n=1080). So, we could say that, in general, the inquired have a positive view of computer operability.

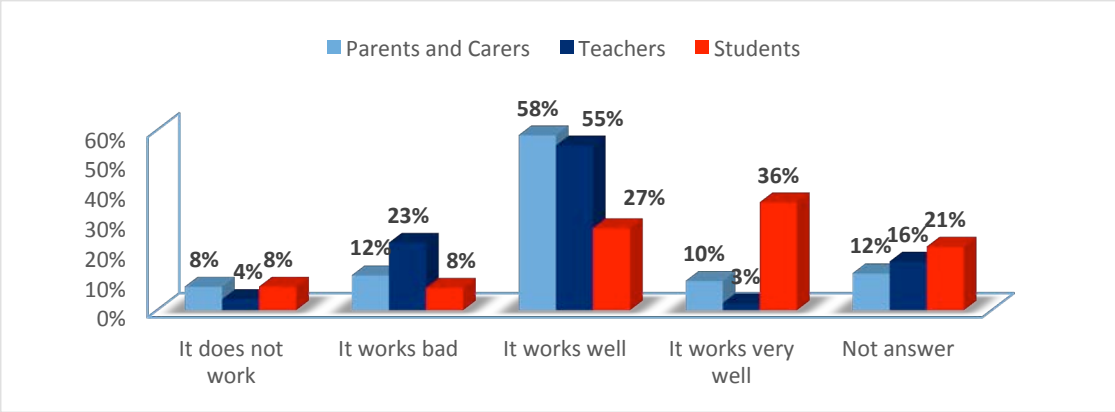


Fig. 10 – Opinion about the operability of computer *Magalhães*.

Based on the data collected, we have analysed the existence of a (in)dependence between different variables in each questionnaire, based on statistical Pearson's chi-square. There are no unexpected dependence, apart from parents' age and the competence to use the computer or know how to use it.

## 4 CONCLUSIONS

From the general results obtained, we emphasize the overall characterization of the teachers, parents/carers' and students' perceptions form a population living and attending Guarda's primary schools. We can pick out their habits when using computers, particularly Magalhães computer. Results demonstrate that almost all the students have a regular contact with computers and ICT, and this contact is made in different contexts and serves multiple purposes.

With this descriptive approach we are also able to typify the parents in Guarda's council, as far as computers and technology are concerned. We can know declare that they self-assess their informatics competence as enough or good, meaning that they are able to run basic operations with computers.

Teachers wish for some entrepreneurship in using the computers at school but there is an evident need of formation and technical support. This issue goes back to universities and education schools during the process of teacher training periods. Entrepreneurship and competence are paths that have to be toddled when preparing teachers for new roles in education, both in terms of technical and pedagogical competence.

Teachers cannot yet show a remarkable competence in using information and communication technology, but this is undoubtedly an on-going trend. Teachers will progress eventually, but it may happen in different pace and only if there is a supportive environment.

However, nonetheless, teachers must be entrepreneurs if they wish to succeed with their student's. On one hand, due to all the economic problems we are dealing with, we should expect less material resources in schools and, on the other hand, the students' ability in informatics is growing.

We can conclude by saying that teachers do use some informatics tools in the teaching and learning process, although it is not a daily or even regular use of computers in schoolwork.

Most of the families have joined the Magalhães program and are satisfied with the way these computers work maybe because they think computers are important in their children's school life. In fact, they see computers are major tools at school, though they do not allow children to use them all the time.

## ACKNOWLEDGEMENTS

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